CITY OF ST. ANTHONY (PWS # 7220067)
SOURCE WATER ASSESSMENT FINAL REPORT

November 8, 2001

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for the City of St. Anthony, Idaho,* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The City of St. Anthony drinking water system consists of two well sources. Both wells have a moderate susceptibility rating to inorganic, synthetic organic, volatile organic and microbial contamination, due to a moderate rating in hydrologic sensitivity, a moderate to high rating for system construction, and few potential contaminant sources. The exception is the Well #5 was automatically rated high susceptibility to microbial contamination because of a positive total coliform detection in May 1996.

Well #5 recorded the presence of total coliform bacteria in May 1996. Since Wells #1 and #2 were taken off line, there have been total coliform bacteria detections in the distribution system in October 1996, July 1997, and August 1998. The City of St. Anthony was under a boil order in August and September 2001 due to a detection of total coliform bacteria in the distribution system. Recently, the City of St. Anthony activated their chlorination system. Each well has a separate and independent gas chlorinating system.

The wells have not recorded volatile organic or synthetic organic contamination during any water chemistry tests. The inorganic contaminant fluoride has been detected, but at levels below the Maximum Contaminant Level (MCL). Nitrate concentrations have been recorded at levels below about 1.0 mg/L in Well #4 and below 1.5 mg/L in Well #5. The Maximum Contaminant Level for nitrate is 10 mg/L. Though there have been limited chemical problems with the system water, the City of St. Anthony should be aware that the potential for contamination from the aquifer still exists. Surrounding agricultural land use practices have contributed to the ratings of “High” for County Level Nitrogen Fertilizer Use, County Level Herbicide Use, and Total County Level Ag-Chemical Use.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of St. Anthony, drinking water protection activities should first focus on correcting any deficiencies outlined in the Sanitary Survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system’s components and its capacity). Also, disinfection practices should be continued to prevent the recurrence of total coliform bacteria. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Additionally, there should be a focus on implementation of practices aimed at reducing the leaching of farm chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources within the delineation zone. Since much of the designated protection areas are outside the direct jurisdiction of the City of St. Anthony, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of source water protection. In addition, the wells should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation is near to urban and residential land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there are transportation corridors near the delineations, the Idaho Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR THE CITY OF ST. ANTHONY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The lists of significant potential contaminant source categories and their rankings used to develop the assessment are also attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The public drinking water system for the City of St. Anthony is comprised of two community ground water wells that serve approximately 3,010 people through approximately 1,170 connections. The wells are located in Fremont County, about 1 mile from each other. Well #4 is located on the north side of town and Well #5 is located on the south side of town. The Henry’s Fork separates the two wells (Figure 1).

The most significant potential water problem currently affecting the City of St. Anthony is that of microbial contamination. Total coliform bacteria have been detected at Well #5 in May 1996 and in the distribution system in October 1996, July 1999, August 1998, and September 2001. The City of St. Anthony was put under a ‘boil order’ notice in August and September 2001. To address this issue, the City of St. Anthony has begun using a gas chlorination system on each of the wells. The water is treated between the wells and the storage facility.

Additionally, there have been detections in the tested well water of the inorganic contaminants (IOCs) fluoride and nitrate at levels below the current Maximum Contaminant Levels (MCLs). No volatile organic contaminants (VOCs) or synthetic organic contaminants (SOCs) have been detected in the well water. The delineations cross areas of concern related to high ratings of “County Level Nitrogen Fertilizer Use”, “Country Level Herbicide Use”, and “Total County Level Ag-Chemical Use”. In addition, the Well #4 delineation crosses an IOC priority area for nitrate.

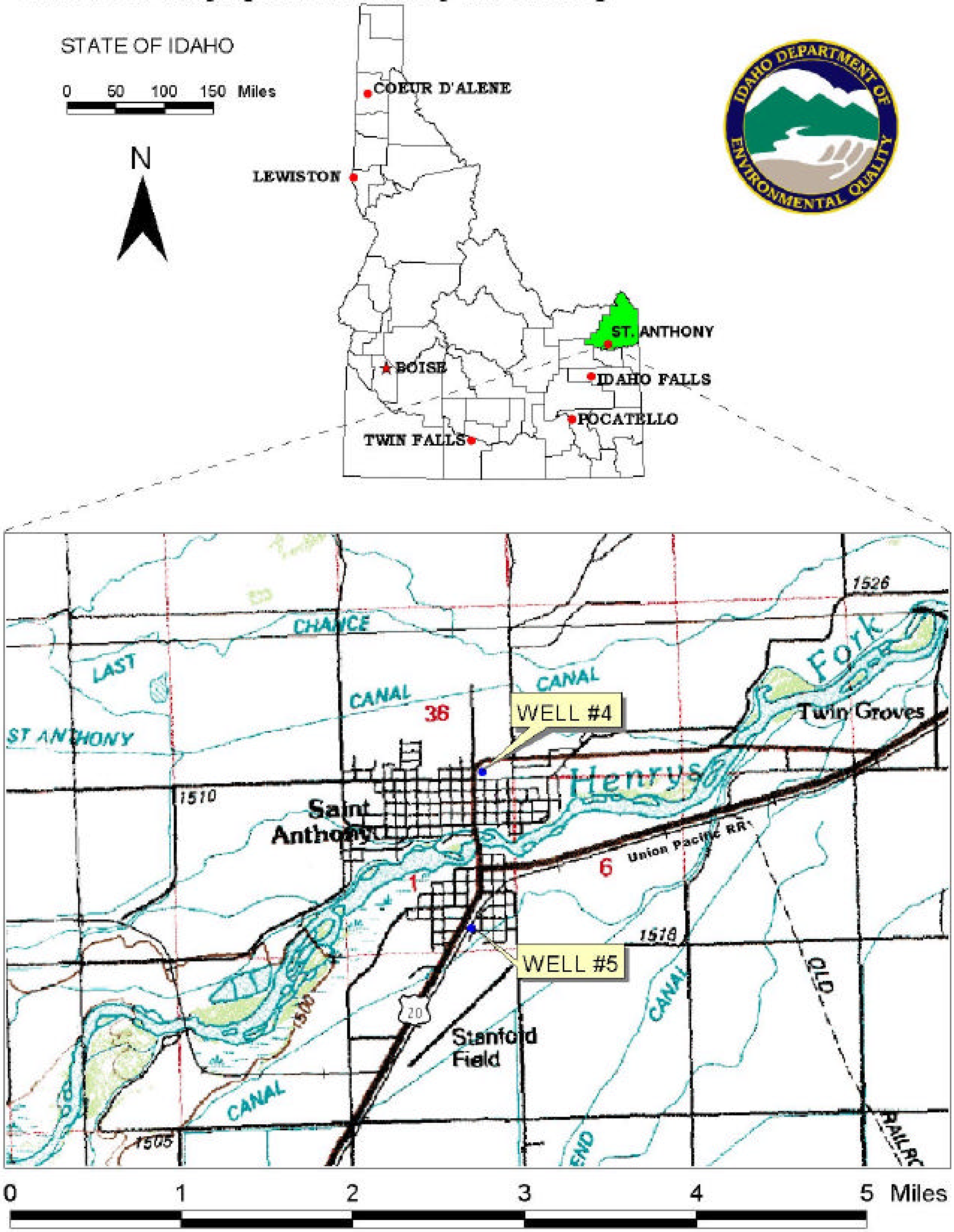
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with Washington Group, International (WGI) to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Eastern Snake River Plain (ESRP) aquifer in the vicinity of the City of St. Anthony wells. The computer model used site specific data, assimilated by WGI from a variety of sources including the City of St. Anthony well logs, other local area well logs, and hydrogeologic reports (detailed below).

The ESRP is a northeast trending basin located in southeastern Idaho. Ten thousand square miles of the basin are primarily filled with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with terrestrial and lacustrine (lake-deposited) sediments along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet in thickness and average 20 to 25 feet (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

The plain is bound on the northeast by rocks of the Yellowstone Group (mainly rhyolite) and Idavada Volcanics to the southwest. The Snake River flows along part of the southern boundary and is the only drainage that leaves the plain. Rivers and streams entering the plain from the south are tributary to the

FIGURE 1. Geographic Location of St. Anthony



Snake River. Other than the Big and Little Wood rivers, rivers entering from the north vanish into the highly transmissive basalts of the Snake River Plain aquifer.

The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet it may be locally confined in some areas because of inter-bedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from several hundred feet near the plain's margin to thousands of feet near the center.

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

Regional ground water flow is to the southwest paralleling the basin (Cosgrove et al., 1999, p. 21; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Ground water flow direction at the local scale is thought to be highly variable due to preferential flow paths through the fractured and layered basalts.

The delineated source water assessment area for the City of St. Anthony Well #4 can best be described as a northeast trending pie-slice that is approximately seven miles long and two miles wide (Figure 2). The delineated source water assessment area for the City of St. Anthony Well #5 can best be described as a eastward trending pie-slice that parallels the Henry's Fork and is approximately six miles long and two and one half miles wide (Figure 3). The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the immediate area of the City of St. Anthony wellheads consists of residential and urban uses, while the surrounding area is predominantly irrigated and undetermined agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the <u>potential</u> for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in July and August 2001. The first phase involved identifying and documenting potential contaminant sources within the City of St. Anthony Source Water Assessment Areas (Figures 2 & 3) through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area.

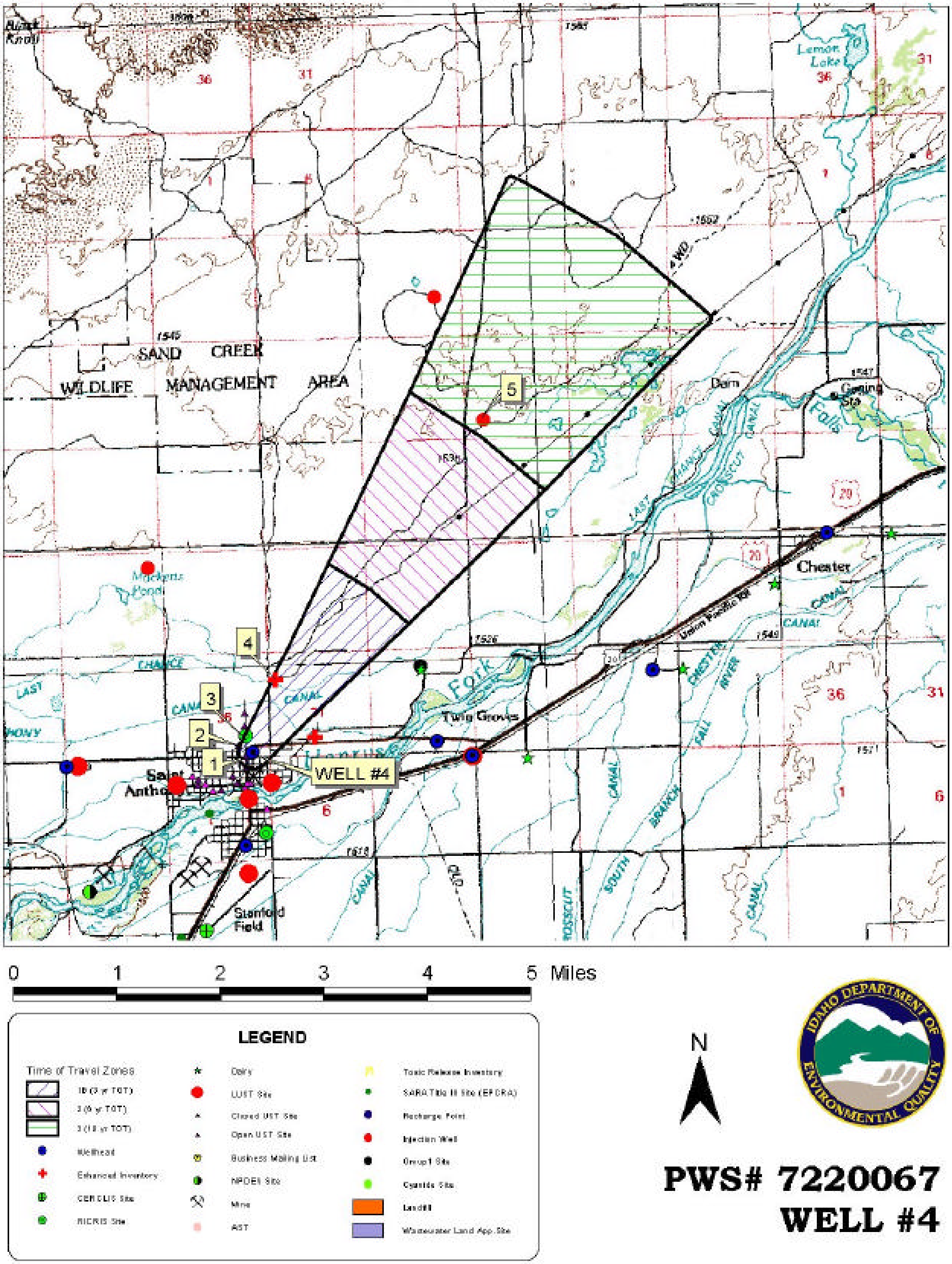
The delineated source water areas encompass corridors of land between the well sites and paralleling the Henry's Fork. The Well #4 (Table 1, Figure 2) delineation has five potential contaminant sources including multiple underground storage tanks (USTs), a county landfill, an active deep injection well and a site regulated under Resource Conservation Recovery Act (RCRA). In addition, the Well #4 delineation crosses Business 20. The Well #5 (Table 2, Figure 3) has seven potential contaminant including USTs, a leaking underground storage tank (LUST), three dairies, and a RCRA site. Additionally, the Well #5 delineation crosses the Union Pacific Railroad and Highway 20.

Table 1. City of St. Anthony Well #4, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	UST – closed	0-3	Database Search	VOC, SOC
2	UST – closed	0-3	Database Search	VOC, SOC
3	RCRA site	0-3	Database Search	IOC, VOC, SOC
4	County Landfill	0-3	Enhanced Inventory	IOC, VOC, SOC, Microbes
5	Active deep injection well	6-10	Database Search	IOC, VOC, SOC
	Stables	?	Enhanced Inventory	IOC (Operator requested adding this source to PCI, even if it is slightly out of the delineation)
	Business 20	0-3	GIS Map	IOC, VOC, SOC, Microbes

[1] UST = underground storage tank, RCRA = Resource Conservation Recovery Act
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 2. St. Anthony Delineation Map and Potential Contaminant Source Locations



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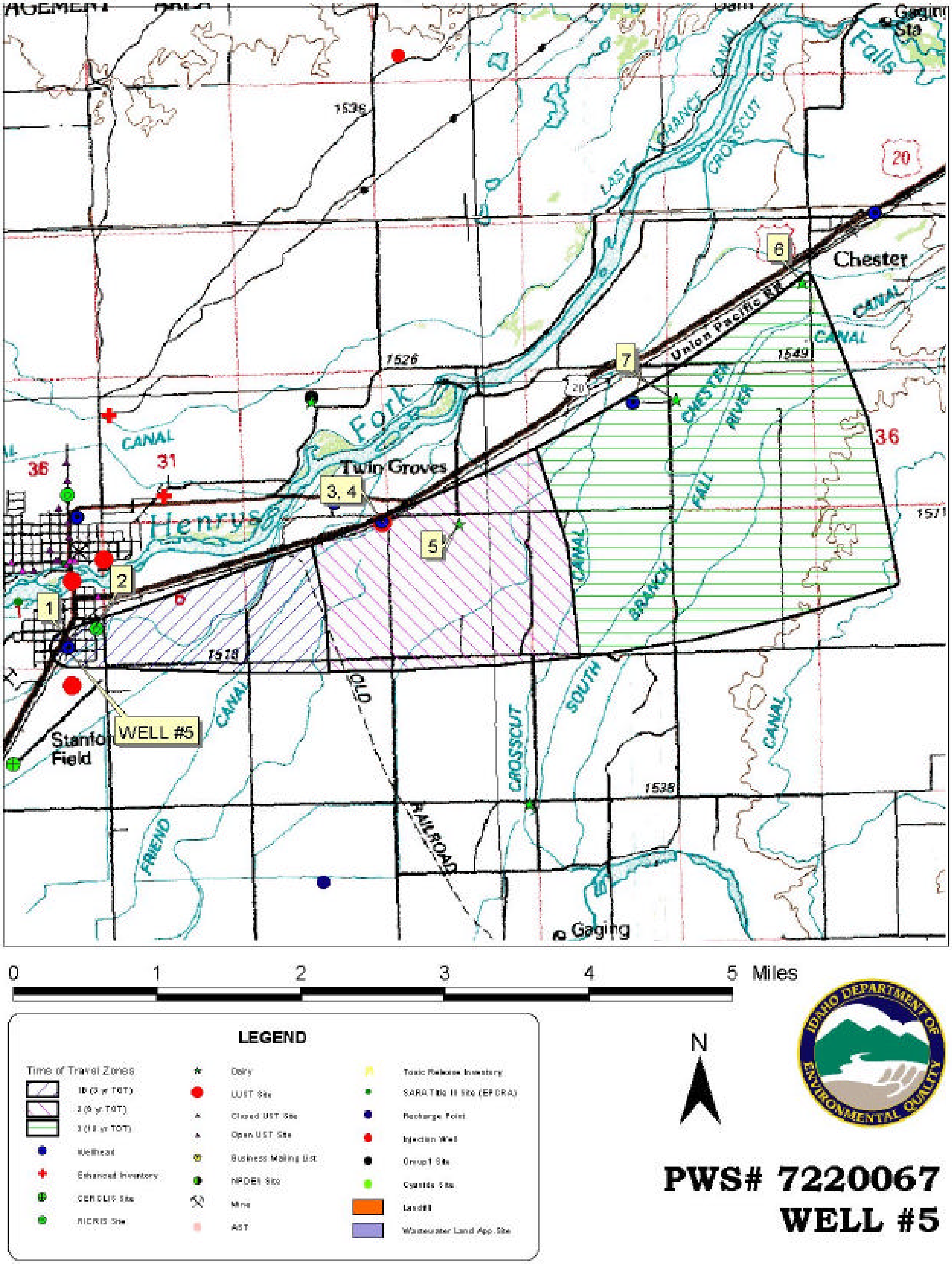

PWS# 7220067
WELL #5

Table 2. City of St. Anthony Well #5, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	UST – closed	0-3	Database Search	VOC, SOC
2	RCRA Site	0-3	Database Search	IOC, VOC, SOC
3, 4	LUST – Site Cleanup Completed, Impact: GROUND WATER; UST – closed	3-6	Database Search	VOC, SOC
5	Dairy ≤ 200 cows	3-6	Database Search	IOC
6	Dairy ≤ 200 cows	6-10	Database Search	IOC
7	Dairy ≤ 200 cows	6-10	Database Search	IOC
	Union Pacific Railroad	0-10	GIS Map	IOC, VOC, SOC, Microbes
	Highway 20	0-10	GIS Map	IOC, VOC, SOC, Microbes

[1] UST = underground storage tank, LUST = leaking underground storage tank, RCRA = Resource Conservation Recovery Act
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets for the system. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity is high for Well #4 and moderate for Well #5 (Table 3). North of the Henry's Fork the soils are well drained, whereas south of the Henry's Fork, the soils become poorly- to moderately-drained. The vadose zone throughout the area is predominantly fractured basalt. Finally, the water table is less than 300 feet from the surface and the wells do not have laterally extensive low-permeability units to retard the downward movement of contaminants.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in Sanitary Surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

Well #4 has a moderate system construction score (Table 3). The well, drilled in June 1965, is 209 feet deep, with 16- to 20-inch diameter casing to a depth of 125 feet below ground surface (bgs). The well log shows that the casing and annular seal were completed in ‘firm brown lava’ at 125 feet bgs. There is open hole construction from 125 feet bgs to the bottom of the hole. The highest production zone is less than 100 feet below the water table. The 1995 Sanitary Survey states that the wellhead and surface seal meet standards, and that the well is protected from surface flooding.

Well #5 has a low system construction score for different reasons (Table 3). Though no Sanitary Survey was available, the Idaho Falls Regional DEQ office determined that the wellhead and surface seal are up to standards and that the well is protected from surface flooding. The well, drilled in November 1995, is 423 feet deep, with 0.375-inch 14- to 16-inch diameter casing. The well log shows that the casing is set to 280 feet bgs into ‘hard black basalt’ and the annular seal is set to 190 feet bgs into ‘solid black scoria’. There is open hole construction from 280 feet bgs to the bottom of the hole. The highest production zone is more than 100 feet below the water table.

A determination was made as to whether current public water system (PWS) construction standards are being met. Though the wells may have been in compliance with standards when they were completed, current PWS well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. These standards include provisions for well screens, pumping tests, and casing thicknesses to name a few. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Eight-inch diameter wells require a casing thickness of at least 0.322-inches and 12-inch and larger diameter wells require a casing thickness of at least 0.375-inches. Lack of a complete “Well Driller’s Report” prevented a determination of whether Well #4 was up to standards. Well #5 does meet current PWS construction standards. As such, Well #4 was assessed an additional point in the system construction rating.

Potential Contaminant Source and Land Use

Well #4 rates moderate for IOCs (i.e. nitrates, arsenic), VOCs (i.e. petroleum products), SOCs (i.e. pesticides) and microbial contaminants (i.e. bacteria). The potential contaminant sources, Business 20, and some agricultural land uses in the delineated source area account for the largest contribution of points to the potential contaminant inventory rating.

Well #5 rates high for IOCs (i.e. nitrates, arsenic), VOCs (i.e. petroleum products), and SOCs (i.e. pesticides) and low for microbial contaminants (i.e. bacteria). The potential contaminant sources, Highway 20, the Union Pacific Railroad, and agricultural land uses in the delineated source area account for the largest contribution of points to the potential contaminant inventory rating.

Well #4 falls within the IOC priority area for nitrate. The wells are also in a county with high levels of nitrogen fertilizer use, high herbicide use, and high total ag-chemical use. Fortunately, no significant water chemistry problems have been recorded in the finished well water. Both wells have consistently shown the IOC nitrate at levels below 1.5 mg/L (the MCL is 10 mg/L). Total coliform bacteria have been detected in Well #5 in May 1996 and in the distribution system in late summer to early fall (October 1996, August 1998, July 1999, August and September 2001). No VOCs or SOCs have been detected in the well water.

Final Susceptibility Ranking

A detection above a drinking water standard MCL, any detection of a VOC or SOC, contaminants within 50 feet of the wellhead, or a detection of total coliform bacteria, fecal coliform bacteria, or *E-coli* bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. In this case, Well #5 scores automatically high for microbial contamination because of total coliform bacteria was detected in May 1996. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, both wells rate moderate for all categories except as noted above.

Table 3. Summary of City of St. Anthony Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #4	H	M	M	M	L	M	M	M	M	M
Well #5	M	H	H	H	L	L	M	M	M	H*[2]

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
[2] H* = Well scores automatically high due to detection of total coliform bacteria at Well #5 in May 1996

Susceptibility Summary

Overall, both wells rate moderate for all categories, except Well #5 was rated automatically high for microbial contamination. The proper design of the two wells combined with the low number of potential sources and limited agricultural uses north of the Henry's Fork contributed to the moderate ratings.

The most significant potential water problem currently affecting the City of St. Anthony is that of microbial contamination. Total coliform bacteria have been detected at Well #5 in May 1996 and in the distribution system in October 1996, July 1999, August 1998, and August and September 2001. The City of St. Anthony was put under a 'boil order' notice in August and September 2001. Additionally, there have been detections in the tested well water of the IOCs fluoride and nitrate at levels below the current MCLs. No VOCs or SOCs have been detected in the well water. The delineations cross areas of concern related to high ratings of "County Level Nitrogen Fertilizer Use", "Country Level Herbicide Use", and "Total County Level Ag-Chemical Use". In addition, the Well #4 delineation crosses an IOC priority area for nitrate.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the City of St. Anthony, drinking water protection activities should focus on correcting any deficiencies outlined in the Sanitary Survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Also, disinfection practices should be maintained to prevent the recurrence of total coliform bacteria. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Additionally, there should be a focus on implementation of practices aimed at reducing the leaching of farm chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources within the delineation zone. Since much of the designated protection areas are outside the direct jurisdiction of the City of St. Anthony, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of source water protection. In addition, the wells should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation is near to urban and residential land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there are transportation corridors near the delineations, the Idaho Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e.

good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office	(208) 528-2650
State DEQ Office	(208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

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Attachment A

City of St. Anthony Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : ST ANTHONY   Well# : WELL #4

Public Water System Number 7220067   09/25/2001 12:38:21 PM

1. System Construction		SCORE			
Drill Date	06/14/1965				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	1995			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	YES	0			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		2			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		6			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	DRYLAND AGRICULTURE	1	1	1	1
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		3	1	3	1
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	3	5	5	2
(Score = # Sources X 2) 8 Points Maximum		6	8	8	4
Sources of Class II or III leacheable contaminants or	YES	4	4	2	
4 Points Maximum		4	4	2	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B	25 to 50% Irrigated Agricultural Land	2	2	2	2
Total Potential Contaminant Source / Land Use Score - Zone 1B		14	14	12	6
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		19	17	17	7
4. Final Susceptibility Source Score		11	11	11	11
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

Ground Water Susceptibility Report   Public Water System Name : ST ANTHONY   Well# : WELL #5

Public Water System Number 7220067   09/25/2001 12:38:35 PM

1. System Construction

		SCORE
Drill Date	11/03/1995	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	NO	0
Well meets IDWR construction standards	YES	0
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	YES	0
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	YES	0
	Total System Construction Score	0

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
	Total Hydrologic Score	4

3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	NO	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	3	4	4	2
(Score = # Sources X 2) 8 Points Maximum		6	8	8	4
Sources of Class II or III leacheable contaminants or	YES	6	3	2	
4 Points Maximum		4	3	2	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		14	15	14	8
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0
Cumulative Potential Contaminant / Land Use Score		26	25	26	10

4. Final Susceptibility Source Score

	IOC	VOC	SOC	Microbial
4. Final Susceptibility Source Score	9	9	9	8
5. Final Well Ranking	Moderate	Moderate	Moderate	High*